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The Agricultural Credit Guarantee Scheme Fund and Nigerian Agricultural Productivity: A Reconsideration of some Stylized Facts and Empirical Nexus

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ABSTRACT

This study examined the impact of the Agricultural Credit Guarantee Scheme Fund (ACGSF) on agricultural output in Nigeria for the period 1981 to 2012. The study focused on the ACGSF loans granted to cash crop and livestock production subsectors and examined the impacts of these loans on the level of the outputs of each subsector. The order of the integration of the variables was tested using Augmented Dickey Fuller (ADF) and Philips-Perron (PP) unit root tests. The Johansen cointegration technique was also used to test the existence of a long-run relationship between the variables. The regression results revealed an insignificant impact of loans to cash crop and livestock production on the level of outputs probably due to the misappropriation of the funds. The study concludes that the disbursement of the loans should be properly monitored by the ministry of agriculture to boost production in the sector.

Keyword: ACGSF, Agricultural Output, Cash Crop, Livestock, Nigeria.

INTRODUCTION

Agriculture has been the mainstay of Nigerian economy and one of the major sources of income for the populace. Olaitan (2006) observed that during the first decade of Nigerian independence, the agricultural sector employed about 70 per cent of its total population. However, this trend changed with the advent of the full commercialization of oil in the 1970s. Consequently, the agricultural sector has diminished drastically in its contribution to the growth of the economy due to the neglect by the government. Indeed, in spite of Nigeria's impressive magnitude of the deposit of primary resources that could be used for effective agricultural activities, the sector has continuously stagnated in terms of diminishing productivity. For example, as from the early 1970s, the contribution of agriculture to gross domestic product (GDP) began to decline from over 60 per cent to 33.6 per cent by 1981. It rose to 40.98 per cent in 2004 and further declined to 33.4 per cent by 2013 (CBN, 2014). The consequences of these failures in the agricultural sector are unemployment, food insecurity and poverty. Unemployment in Nigeria, for instance

varied from 1 per cent in 1980, 3.2 per cent in 1992 and 3.8 in 2006 to 23.9 per cent in 2011 (CBN, 2004; Olaitan, 2006; WDI, 2013).

However, the new dawn of oil exploration and its attendant revenue have made the economy mono-cultural, depending heavily on oil revenue. The issues of oil glut, international oil prices fluctuations, enormous political expenditures and corruption have serious implications for oil dependent countries. It can be deduced based on these observations that oil-dependent economies like Nigeria seem to be prone to socially damaging rent-seeking behaviours that breed corruption in business and government, thereby distorting the allocation of resources and reducing both economic efficiency and social equity (Tomell and Lane, 1999; Baland and Francois, 2000; Gylfason, 2000 and Torvick, 2002).

A number of other reasons that accounted for the decline in agricultural productivity range from the inadequate supply of agricultural inputs, poor marketing and gross inadequacies of relevant infrastructures, rural urban migration, poor funding, to faulty domestic policies on agriculture. But the occurrences of these factors are evidenced aggregate poor productivity in the sector. One of the good steps taken in the direction towards restoring the past glory of the agricultural sector from a shamble state is the initiation and establishment of Agricultural Credit Guarantee Scheme Fund (ACGSF) based on Decree Number 20 of 1977 but became effective in 1978. The decree provided that a sum of hundred million naira (N100 million) be given to benefitting farmers and the federal government was to provide 60 per cent while the CBN contributes 40 per cent of the said amount. However, as the numbers of applicants increased, coupled with the need to expand the growth of the sector, the share and called up capital of the fund was increased to N6 Billion (CBN, 1990; Efobi and Osabuohien, 2011). Furthermore, the decree was amended in 1990 in order to cater for the need to achieve an enhanced distribution of the loans, determining the limit of the amount to benefit, the waiver of the requirement for security and requiring the benefitting farmer to produce an introductory letter from the village head and an extension worker.

The statistical classification of the various aspects of agriculture that have attracted the disbursement of loans from the scheme include Cash Crop Production (CCP), Livestock Production (LSP) and Food Crop Production (FCP). Also, the ultimate expectation of the scheme is to raise total production and increase foreign exchange earnings through the exportation of these products. However, Njoku and Odii (1991) observed that the rate of repayment by the beneficiaries of the loans was very low. The causes of these problems may not be significantly different from issues of poor farm management, low product prices, loan diversion and the deliberate refusal to pay by the beneficiaries. Apart from ACGSF, the CBN stated that there were other farm credit schemes like the Nigerian Agricultural and Co-operative Bank (now known as the Nigerian Agricultural Co-operative and Rural Development Bank) established in November 1972. Also, the establishment of rural branches of Commercial banks following a mandatory Federal Government policy directive in 1976; the creation of the River Basin Authorities in 1979 and the establishment of Agricultural Development Projects between 1972 and 1980 to facilitate the provision of agricultural credit to farmers, among others.

However, empirical studies on the assessment of the performance of most of the aforementioned credit schemes are scanty. This fact is supported by Mafimisebi, *et al.* (2009) and Nwosu, *et al.* (2010) who observed that the persistent failure of most of these institutions and conventional banks to adequately finance agricultural activities in the mid-1970s was a clear evidence that further financial and institutional reforms that would revitalize the agricultural sector through encouraging the flow of institutional credit are needed, hence, the justification for the establishment of ACGSF in 1977. Although Mafimisebi *et al.* (2009) and Nwosu, *et al.* (2010) examined the problems and prospects of ACGSF while Efobi and Osabuohien (2011) examined the role of ACGSF in the promotion of non-oil export in Nigeria notwithstanding, empirical evidence on how ACGSF has impacted the growth of the agricultural sector in a disaggregated form in Nigeria is scarce. This study attempts to fill this void by establishing an empirical nexus between the quanta of credits granted under the scheme for cash crop, livestock production and agricultural sector productivity for the period 1981-2012. In addition to the foregoing, therelevant literature on agricultural production and ACGSF in Nigeria was reviewed in section 2; section 3 addresses the research methodology used and section 4 presents the results while section 5 concludes the paper.

LITERATURE REVIEW

Conceptual issues

Agricultural Production

The extent of agricultural production in most developing countries is low due to constraints such as lack of capital and lack of storage facilities, among others. This translates to low productivity, output and income in the agricultural sector. According to Nweze (1994), the transformation of smallholder agriculture in Nigeria from subsistence to market orientation requires the injection of more capital. But as capital accumulations are elusive, investors and farmers resort to credit for the management of the farms. Undoubtedly, with the ageing trend of farmers and the high rate of rural-urban migration of young school leavers, the cost of labour for agricultural production in Nigeria is expensive with its attendant effects of lowering agricultural productivity. Ezedinmma and Chukuezi (1999) asserted that hired labour can be exorbitant and so they recommended that farmers combine family and hired labour. Thus, the problem of labour supply for agricultural productivity can be solved as well with increased access to credit.

Guidelines to the Agricultural Credit Guarantee Scheme Fund

As noted earlier, the main purpose of the ACGSF scheme was to provide guarantees in respect of the loans granted by any bank that gives such loans for agricultural purposes. Here, commercial banks' sectoral credit allocation (agriculture in particular) was boosted. Prior to this scheme, other credits facilities meant for farmers had failed abruptly due to lack of collateral security. With ACGSF, security can be offered to any bank for the purpose of any loan that is classified under the scheme. These loans can either be long term or short term, depending on the purpose of usage. Concerning the legality of the fund and its terms, the scheme provided that in

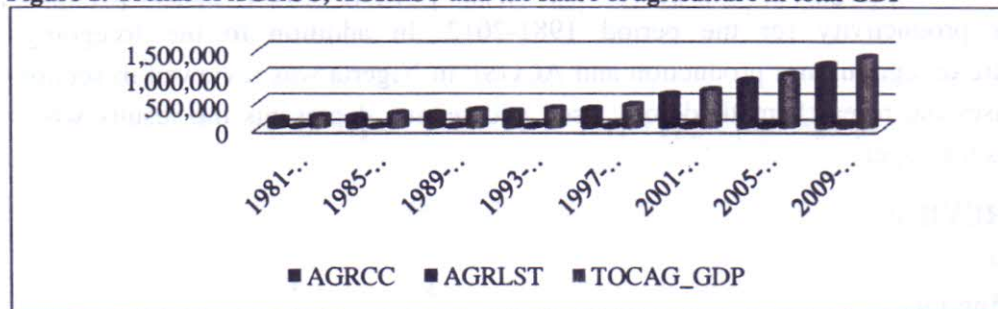
compliance with Section 8 of the ACGSF decree, every agreement for a loan in respect for which the guarantee is to be given must be in writing and show the amount of the loan, the rate of interest and the duration of the loan.

The agricultural output from cash crop and livestock production as AGRCC and AGRLST is shown in figure 1, while TOCAG_GDP denotes the total contribution of agricultural sector to overall GDP.

Stylized facts on Agricultural output and ACGSF Profile in Nigeria

Trend Analysis of Agricultural Output in Nigeria

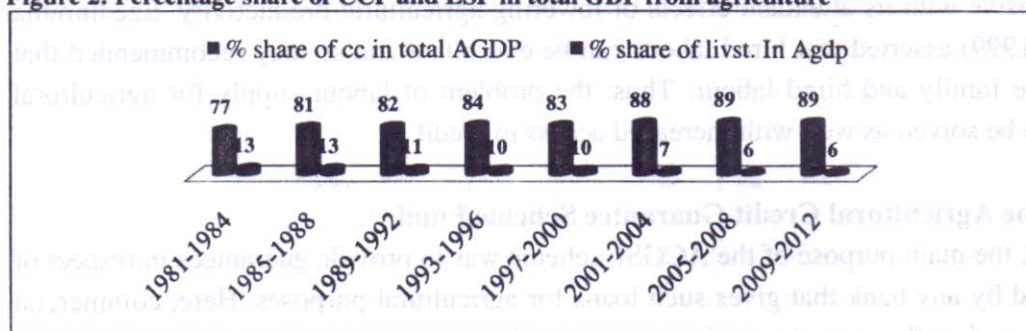
Figure 1: Trends of AGRCC, AGRLST and the share of agriculture in total GDP



Source: Authors' computation from CBN Statistical Bulletin, (2012).

The first notable characteristics of the trajectory of the variables are that Cash Crop Production (CCP) has the larger share of the overall agricultural contribution to aggregate GDP in Nigeria. AGRCC grew in tandem with the increase in total agricultural output, while the trend in output from the livestock sub-sector of agricultural output (AGRLST) is low. It is observed that there have been progressive increases in the general trend of the output of the agricultural sector.

Figure 2: Percentage share of CCP and LSP in total GDP from agriculture



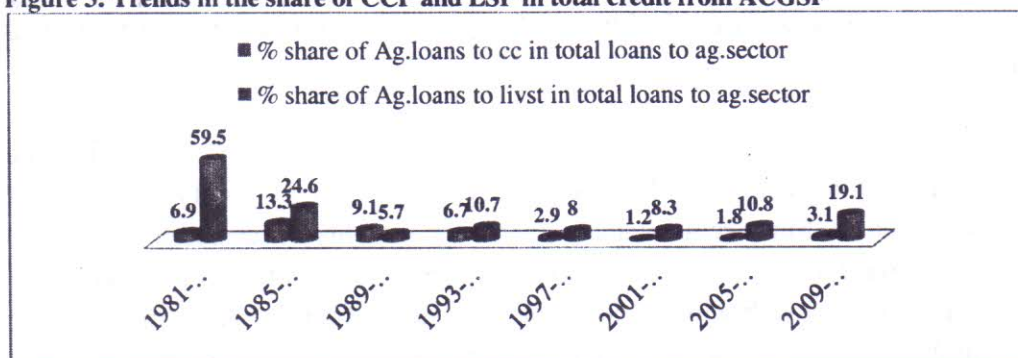
Source: Authors' computation from CBN Statistical Bulletin, (2012).

The share of cash crop in total Agricultural GDP increased progressively from 77% in 1981-1984 to 84% in 1993-1996. The trend slowed to 83% in 1997-2000, but rose steadily between 88% and 89% from 2001-2012. The trends in the periods 2005-2008 and 2009-2012 were equal.

On the contrary, the trend in the growth or share of livestock production in total agricultural GDP steadily decreased from 13% in 1981-1984 to 6% in 2009-2012. It is worth noting that the declines in the contributions from the livestock sector to the total Agricultural GDP in 1981-1984 and 1985-1988 was 13%, 10% in 1993-1996; 1997-2000, and 6% for 2005-2008 and 2009-2012. One of the implications of the trend analysis is that most Nigerians farmers go into crop production than livestock production, hence the larger share of cash crop relative to the share of livestock production in the total agricultural share of GDP. Even in recent years, the percentage contribution of livestock production in the share of the agricultural sector to the total GDP has declined.

Trends in the growth of Credit to the Agricultural Sector in Nigeria

Figure 3: Trends in the share of CCP and LSP in total credit from ACGSF



Source: Authors' computation from CBN Statistical Bulletin, (2012).

It can be observed that the percentage of loans that went to the cash crop subsector is lower than the share of loans to the livestock subsector. The highest percentage of loans accrued to the cash crop subsector occurred in 1985-1988 at 13.3%, while the highest percentage of loans that went to livestock subsector stood at 59.5 in 1981-1984. Overall, the credit availability to the livestock subsector was more than the cash crop subsector; yet, the contribution of the livestock subsector to total agricultural output measured in GDP in figure 2 was lower than that for the cash crop. It implies that there is lack of prudence and credit monitoring for most of the loans given to livestock farmers at various times. This is because, while the loans given for livestock production were higher than those of cash crops, productivity in cash crop was far higher than productivity from the livestock.

Empirical Issues

Various studies have shown the significance of credit facilities in economic growth and development. In the agricultural sector, Nwosuet *et al* (2010) stated that various agricultural credit facilities instituted in Nigeria to assist in the development of the sector have failed. However, with reference to ACGSF, Ajobo and Oguntade (1996) found a long-run relationship between the number and volume of guaranteed loan by ACGSF and economic growth. The finding shows that it is important to expand the quantum of funds available for guaranteeing agricultural loans in order to increase the level of the productivity of the sector. Similarly, Efobi and Osabuohien

(2011) established a long-run effect of ACGSF on the food crop as well as livestock in which a positive impact of ACGSF on these categories of agriculture exists alongside other non-oil exports.

Exploring the effects of the operations of ACGSF on cash crops using simple linear regression and autoregressive model, Isiorhovaja and Chukwuji (2009) found that cash crops output had a significant upward trend as a result of significant increases in the value of loans guaranteed to cash crop farmers but the number of loans showed no significant increase. This indicates that the amounts of loans offered were significantly small relative to the amount of these cash crop farmers requested as loans. Odoemenem (1991) identified production expansion as the primary motivation of farmers for borrowing. Others are profit optimization and improved family standard of living. Despite all these, a third of the credit needs in rural areas are met by formal lending agencies.

These obvious inefficacies of the formal credit institutions in lending to farmers have led to the dominance of informal credit associations. These include cooperatives, community development associations and moneylenders. Many reasons are given for the inability of formal institutions to meet credit needs in Nigeria. Firstly, they are controlled through their headquarters located in the cities. This has put them out of touch with the needs of subsistence farmers. Also, the untimely release of funds, cumbersome loan procedures and high interest rates limit farmers' access to loans from this sector. Obeta (1992) found that despite the substantial resources possessed by the formal lending sources, there is still the inadequacy of credit. Thus, there is the need to evolve a means of stimulating formal credit availability to rural areas. Nweze (1991) remarked that the objectives of cooperative associations are to pool capital resources, labour for farm work, provide financial assistance to members in need and community development.

As a matter of fact, scholarly attentions have much been focused on informal credit sources due to the failures of formal credit institutions. On this note, Jerome (1991) appreciated the role of informal associations in the mobilisation of rural savings for economic development in Nigeria and posited that these roles are not officially appreciated because of the rudimentary nature of their operations and the lack of legislation guiding and standardizing their operations. Therefore, the gaps unfilled by informal associations are taken over by moneylenders who usually charge high interest rates but are willing to lend money at great risk. Eboh et al (1991) attributed this willingness to collateral undervaluation.

Loan default has been a major factor that hinders the effectiveness of many credit facilities, including ACGSF in Nigeria. In an empirical assessment of loan repayment performance, Njoku and Odii (1991) asserted that data on loan repayment performance are inconsistent and vary from location to location. They showed that the repayment performance of 27% is dominant in the South-East zone. They attributed this to low enterprise returns, the diversion of loans to non-

agricultural enterprises and political consideration in loan approval. In the South-West geopolitical zone, Ewuola and Williams (1992) recorded a loan recovery rate of 67%. Enterprise profitability and loan percentage given in kind were significantly and positively correlated to percentage of loan recovered.

Also, the Council for the Development of Social Science Research in Africa (1998) and Ukoha (1999) argued that the increase of credit facilities as a result of the deregulation policy has not been sustained. Among the reasons given for not sustaining the pace are poor policy implementations, lack of complementary policy measures to support core policy initiatives and an imprecise agricultural development strategy during the period of reforms. According to Nwosu, *et al.* (2010) since the establishment of ACGSF, there has been a steady increase in the amount of loans that have been disbursed by banks to farmers, starting from 341 loans amounting to N11.28 million in 1978 to 3,571 amounting to N218.60 million in 2006. Also, the statistics of the CBN shows that a total number of 453,748 loans valued at N11.28 billion have been guaranteed from the establishment of the scheme.

However, a number of problems has been identified for the ineffective operation of ACGSF. For instance, ACGSF has the problem of publicity as low turn up of farmers for such loans in different states were recorded (Nwosu, *et al.* 2010). In addition, despite ACGSF, Nigeria is still food insecure (Okolo, 2004). The establishment of ACGSF is to enhance the export capacity of agricultural produce (Somayina, 1981), yet Efobi and Osabuohien (2011) found a decline in the value of ACGSF during 2005-2006. Indeed, if the scheme is well managed it has the potency for poverty reduction among households (farmers).

METHODOLOGY

Theoretical Framework and Model Specification

The empirical model for this study is anchored on the theoretical framework of the neoclassical Production Function (PF) that shows the relationship of the outputs with inputs (factors of production). The primary function of PF is to address the issue of efficiency in the allocation of factor inputs. For instance, a PF can be expressed in a functional form as:

$$Q = f(X_1, X_2, X_3, \dots, X_n) \quad (1)$$

Where: Q = Quantity of output; X_1, X_2, X_3 and X_n = Quantities of various factor inputs employed.

Equation (1) implies that total quantity of output is functionally related to the various factor inputs combined. Although there are various types of PF the Cobb Douglas PF (C-D PF) is applied in this study, as C-D PF is widely used to represent the technological relationship between the amounts of two or more inputs. It is denoted as:

$$Y = AL^\beta K^\alpha \quad (2)$$

Where: Y = Total Product, L = labour, K = Capital, A = Total factor productivity, and α & β = Output elasticity. Although it is necessary to model the unit of labour supply by the household used to produce agricultural output, this study is more concerned on credits granted to farmers. This input is disaggregated into loans from ACGSF to farmers for Cash Crop Production and Livestock Production. Thus, the reduced form of the algebraic model in equation (2) is re-specified as:

$$Y = f(K^\alpha)_L \quad (3)$$

Equation (3) implies that the output of the agricultural production is modelled as a function of capital, while labour input is held constant and α measures the output elasticity of capital. By taking the natural log of both side of equation (3) and express it in a deterministic function, equation (3) can be re-specified as follow:

$$\ln Y = \alpha_0 + \alpha_1 \ln K \quad (4)$$

Therefore, drawing from the theoretical building of the model of C-D PF in equation (4), three concise models for the empirical estimations are therefore specified.

Model 1: Impact of ACGSF on the output of Cash Crop Production

Functionally, $QCCP = f(LCCP, EXR, INTR, CPI) \quad (5)$

Where: $QCCP$ = Output from Cash Crop Production measured; $LCCP$ = ACGSF Loans for Cash Crop Production measured as a percentage of total loan; EXR = Exchange rate, $INTR$ = Interest rate, and CPI = Consumer Price Index. The estimable form of equation (5) is specified as:

$$\ln QCCP_t = \alpha_0 + \alpha_1 \ln LCCP_t + \alpha_2 EXR_t + \alpha_3 INTR_t + \alpha_4 \ln CPI_t + \mu_t \quad (6)$$

The theoretical or a priori expectation is that loans from agricultural credit guarantee scheme fund for cash crop production will have a positive impact on the cash crop output, while exchange rate and interest rate are expected to affect cash crop output negatively, hence, the coefficients α_1 and $\alpha_4 > 0$; α_2 and $\alpha_3 < 0$.

Model 2: The Impact of ACGSF on the output of Livestock Production

The model to be estimated for the effect of ACGSF on livestock production is stated in an econometric form as:

$$\ln QLSTP_t = \beta_0 + \beta_1 \ln LLSTP_t + \beta_2 EXR_t + \beta_3 INTR_t + \beta_4 \ln CPI_t + \varepsilon_t \quad (7)$$

Where: $QLSTP$ = Agricultural output from livestock Production; $LLSTP$ = ACGSF Loans for Livestock Production measured as a percentage of total loan and ε_t is the error term. Other variables remain as defined earlier. From equation (7), it is expected that loan from ACGSF to

farmers for livestock production and price level will have positive impact on the livestock agricultural output, while exchange rate and interest rate will affect livestock agricultural output negatively. Therefore, the expected results for all the coefficients of the parameters are: β_1 and $\beta_4 > 0$; β_2 and $\beta_3 < 0$.

Model 3: Impact of ACGSF on Aggregate Agricultural Output

The model for the estimation of the impact of ACGSF on agricultural output is stated as:

$$\ln AGGDP_t = \delta_0 + \delta_1 \ln LLSTP_t + \delta_2 \ln LCCP_t + \delta_3 EXC_t + \delta_4 INTR_t + \delta_5 \ln CPI_t + \theta_t, \dots (8)$$

Where $AGGDP_t$ is the aggregate agricultural output and θ_t is the error term. Other variables remain as defined earlier. The theoretical expectations of the coefficients of the parameters are: $\delta_1, \delta_2, \delta_5 > 0$ while $\delta_3, \delta_4 < 0$.

Estimation Technique

Since the structure of the data is time series, the stationarity properties of each of the variables were verified to avoid spurious regression. Thus, the unit root test, based on the mechanism of the Augmented Dickey Fuller (ADF) and Phillip Perron (PP) were applied to ascertain the order of integration of the variables. Furthermore, the Johansen cointegration test was also used to test the existence of the long-run relationship between the dependent and independent variables for the three models. The study employed error correction mechanism (ECM) to estimate models 1-3.

Sources of Data

The data used in this study were secondary data. They were obtained from the Central Bank of Nigeria (CBN) statistical Bulletins and World Development Indicators (WDI) (2012 editions). Data on aggregate agricultural output, output from cash crop, output from livestock, ACGSF loan to cash crop, ACGSF loan to livestock, exchange rate and interest rate were sourced from the CBN statistical bulletin. The consumer price index was sourced from World Development Indicators (WDI). The study covers the period from 1981 to 2012.

PRESENTATION AND ANALYSIS OF RESULTS

The Unit Root and Cointegration Tests Results

In Table 1, the unit root tests results show that all the variables were stationary at first difference except $QLSTP_t$ and CPI_t that were stationary at second difference. This indicates that variables $QLSTP_t$ and CPI_t are integrated of order two $I(2)$, while the remaining variables are integrated of order one $I(1)$.

Table 1: Unit Root Tests

Variable	Augmented (ADF)	Dickey	Fuller	Phillips-Perron (PP)			Order of Integration
	Level	First Difference	Second Difference	Level	First Difference	Second Difference	
QCCP	1.4127	-4.8959*		2.7423	-4.3592*		I (1)
QLSTP	5.7186	-2.1771	-6.7612*	4.9258	-2.1571	-10.0502*	I (2)
LCCP	-2.5590	-5.2727*		-2.6084	-5.4043*		I (1)
LLSTP	-2.0800	-5.5987*		-2.5983	-5.6221*		I (1)
AGGDP	1.7301	-4.6875*		2.8713	-4.6832*		I (1)
EXR	-1.7766	-4.2217**		-1.8112	-4.1965**		I (1)
INTR	-2.8832	-7.6004*		-2.7547	-7.6004*		I (1)
CPI	2.7453	-2.6712	-5.7762*	2.5972	-2.6035	-9.7302*	I (2)

*, ** denote significant at 1% & 5% respectively.

Source: Authors' computation

Cointegration results for model 1 indicate at least 1 cointegrating equation at the 5 per cent level as shown in Table 2. This implies that a long-run relationship exists between the dependent and independent variables. The cointegration results for model 2 also indicate the existence of a long-run relationship between the dependent variable and its determinants. As shown in Table 3, the Trace test results indicate 2 cointegrating equations at the 5 per cent level, which implies that the variables are cointegrated. Table 4 reveals the results of the cointegration test for model 3. The Trace test indicates at least 3 cointegrating equations at the 5 per cent level, which means the existence of long-run relationship between dependent variable and independent variables.

Table 2: Cointegration Results for Model 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.824183	98.65103	69.81889	0.0001
At most 1	0.566293	46.50161	47.85613	0.0666
At most 2	0.337628	21.44003	29.79707	0.3308
At most 3	0.183331	9.082173	15.49471	0.3578
At most 4	0.095359	3.006521	3.841466	0.0829

Trace test indicates 1 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 3: Cointegration Results for Model 2
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.894924	125.3472	69.81889	0.0000
At most 1 *	0.650605	57.75510	47.85613	0.0045
At most 2	0.358104	26.20856	29.79707	0.1226
At most 3	0.247140	12.90871	15.49471	0.1182
At most 4 *	0.136200	4.392432	3.841466	0.0361

Trace test indicates 2 cointegratingeqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Table 4: Cointegration Results for Model 3
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.772829	133.5858	95.75366	0.0000
At most 1 *	0.740096	89.12420	69.81889	0.0007
At most 2 *	0.519424	48.70092	47.85613	0.0415
At most 3	0.387398	26.71785	29.79707	0.1087
At most 4	0.234246	12.01665	15.49471	0.1561
At most 5 *	0.125113	4.009805	3.841466	0.0452

Trace test indicates 3 cointegratingeqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Regression Results

Model 1: ACGSF and Output from Cash Crop production

The long-run regression results for the impact of loan granted under the scheme for cash crop production, as summarized in Table 2, show that the explanatory variables for model 1 accounted for about 99.5 per cent variation in output from cash crop production. By implication, the independent variables included in model 1 are the major determinants of output from cash crop production.

In terms of the individual significance of the explanatory variables, the results reveal that all the independent variables were statistically significant except the $\ln LCCP_t$ variable. The exchange rate variable (EXC_t) did not appear with expected sign but statistically significant at 1 per cent level. Interest rate variable came out with the expected sign and is statistically significant in determining the output of cash crop production. It means that a 1 per cent increase in interest rate will lead to about a 1.38 per cent decrease in cash crop production. The $\ln CPI_t$ variable did not only conform with the a-priori expectation but is also significant at the 1 per cent level. The significance of this variable implies that output from cash crop production will increase

significantly if the price increases by 1 per cent. The insignificance of loans to cash crop production ($\ln LCCP_t$) could be attributed to the siphoning and mismanagement of public fund by insincere and corrupt officers.

In the short-run, only the consumer price index ($DD(\ln CPI_t)$) and the error correction term ($ECM(-1)$) were statistically significant, as shown in Table 3. The significance of the error correction term ($ECM(-1)$) suggests a moderate speed of convergence to equilibrium level in the long-run.

Table 2: Long-run Results of the Estimated Models

Variable	Model 1	Model 2	Model 3
Dependent Variable	$\ln QCCP_t$	$\ln QLSTP_t$	$\ln AGGDP_t$
Independent Variables			
C	3.441108 (0.0000)*	2.775399 (0.1195)*	-0.265333 (0.7610)
$\ln LCCP_t$	0.098763 (0.1020)		-0.003011 (0.9440)
$\ln LLSTP_t$		-0.361614 (0.7958)	3.334505 (0.0001)*
EXR_t	0.006720 (0.0001)*	0.005036 (0.0086)*	0.005787 (0.0000)*
$INTR_t$	-0.013826 (0.0935)***	-0.037122 (0.0087)*	-0.032711 (0.0000)*
$\ln CPI_t$	1.070701 (0.0000)*	0.937255(0.0043)*	0.349927 (0.0267)**
R-squared	0.994735	0.983657	0.997519
Adjusted R-squared	0.993955	0.981236	0.997042
F-statistic	1275.216	406.2674	2090.463
Prob(F-statistic)	0.000000	0.000000	0.000000
Durbin-Watson stat.	1.142812	2.392826	1.487594

*, ** & *** denote significant at 1%, 5% and 10% respectively.

Source: Authors' computation

Model 2: ACGSF and Output from Livestock Production

The long-run results for model 2 reveal that ACGSF loans to livestock production ($\ln LLSTP_t$) was not significant in determining output from livestock production. Although the exchange rate variable did not appear with the expected sign, yet it is statistically significance at 1 per cent level. The interest rate variable conforms with the expected sign and significantly determines livestock production output. The results show that 1 per cent decrease in interest rate will increase livestock output by approximately 3.7 per cent. The consumer price index variable was also significant at 1 per cent level, which implies an increase in price will lead to a significant increase in livestock production output. The value of R-square (0.98) indicates that about 98 per cent variation in livestock output is caused by variation in the independent variables included in the model. By implication, the model is of good fit.

Table 3: Short-run Results of the Estimated Models

Variable	Model 1	Model 2	Model 3
Dependent Variable	$D(\ln QCCP_t)$	$DD(\ln QLSTP_t)$	$D(\ln AGGDP_t)$
Independent Variables			
C	0.069032 (0.1270)	-0.102929 (0.3414)	0.026826 (0.3036)
$D(\ln LCCP_t)$	0.031110 (0.4624)		-0.008484 (0.7197)
$D(\ln LLSTP_t)$		0.952215 (0.6555)	4.857671 (0.0000)*
$D(EXR_t)$	0.000243 (0.8988)	0.009821 (0.0379)**	0.000976 (0.3768)
$D(INTR_t)$	-0.008235 (0.2379)	-0.019442 (0.2331)	-0.009745 (0.0309)**
$DD(\ln CPI_t)$	0.885461 (0.0001)*	0.477347 (0.4047)	-0.070255 (0.5659)
ECM(-1)	-0.468291 (0.0059)*	-2.117860 (0.0000)*	-0.321776 (0.0375)**
R-squared	0.521739	0.702269	0.834619
Adjusted R-squared	0.426087	0.640242	0.791476
F-statistic	5.454539	11.32195	19.34545
Prob(F-statistic)	0.001581	0.000011	0.000000
Durbin-Watson stat.	2.033318	1.861795	1.002371

* & ** denotes 1% and 5% respectively).

Source: Authors' computation

The short-run regression results for model 2 show that three variables: loan to livestock production, interest rate and consumer price index were not significant. The exchange rate variable did not appear with the expected sign but is statistically significant at the 5 per cent level. The error correction term ($ECM(-)$) has the correct sign and is significant at the 1 per cent level, which signifies the smooth speed of adjustment to equilibrium in the long-run

Model 3: ACGSF and Aggregate Agricultural Production

The long-run results for model 3 reveal the impact of credit granted for both cash crop and livestock production under ACGSF on aggregate agricultural output as shown in Table 2. Loan granted to cash crop is not significant and even appears with the wrong sign. The loan granted to livestock production came out with the expected sign and is statistically significant at the 1 per cent level. The exchange rate variable appears with the wrong sign but is statistically significant. The results also reveal that the interest rate is a significant variable that determines the level of aggregate agricultural output. An increase in the interest rate by 1 per cent leads to about 3.27 per cent decrease in the output of agricultural production. The $\ln CPI$ variable also appears with the correct sign and is statistically significant at the 5 per cent level, which means an increase in price by 1 per cent will lead to approximately 35 per cent increase in aggregate agricultural output.

The results of the short-run analysis show that while the loan granted to cash crop production is not significant, that granted to livestock production is significant at the 5 per cent level. The exchange rate and price variables were not significant. The error correction term came out with the expected sign and is statistically significant, signifying a moderate speed of convergence from short-run disequilibrium to long-run equilibrium. The explanatory power for model 3 is quite satisfactory with adjusted R^2 of 0.79 and 0.99 for short-run and long-run, respectively.

CONCLUSION

From the analysis, it could be observed that the percentage of agricultural loans under ACGSF that went to the cash crop subsector of agricultural sector is lower than the share of loans to the livestock subsector. Yet, cash crop production outperformed livestock production in terms of their contributions to aggregate agricultural output in Nigeria within the period under study. The insignificance of credits under ACGSF to both cash crop and livestock productions could be ascribed to the misappropriation and siphoning of the funds to unproductive activities. It is therefore imperative for the Ministry of Agriculture to ensure that the credits under ACGSF get down to the target farmers to boost the production in this sector. This is important now that the country is making efforts to diversify the economy from the oil sector to other sectors of the economy in which the agricultural sector is paramount.

Also, agricultural extension workers need to put more efforts in their enlightenment campaign by educating livestock and cash crop farmers on how to use the credit from ACGSF judiciously. In addition, farmers need to be enlightened more on the basic requirements for increased productivity. If these suggestions are implemented, the nation will be food sufficient and the objective of improved agricultural productivity through credit accessibility by farmers to boost cash crop export production will be achieved.

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